DOCUMENT RESUME

ED 299 535 CG 021 181

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TITLE New Technologies in Screening for Disease Risk: Implications for the Worksite and for Health Education.
PUB DATE 21 Oct 87
NOTE 15p.; Paper presented at the Annual Meeting of the American Public Health Association (115th, New Orleans, LA, October 18-22, 1987).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Employer Employee Relationship; *Employment Practices; *Ethics; *Health; High Risk Persons; *Identification; *Job Applicants; *Screening Tests

ABSTRACT

The screening of workers for health problems has been ubiquitous in the worksite for many years. These screening procedures may have ethical and policy implications. Three common types of screening in use include pre-employment, early identification of health problems, and employee monitoring. Pre-employment screening may be used to screen out individuals who would be at increased risk for health problems if exposed to hazardous materials at the worksite. Screening for disease may discriminate against individuals with particular ethnic and racial backgrounds, since some diseases may be concentrated in a particular ethnic group. Society may be facing an important dilemma between strategies to improve or maintain the health of employees and access to jobs and socioeconomic position, especially when biological markers for disease susceptibility which have nothing to do with worksite exposure are used. There are few restrictions on the uses of pre-employment screening information provided by an employee to an employer, while at the same time the validity of the tests used in pre-employment screening may be questioned. Biological screening tests should not be used as a part of employee selection, unless the screening test indicates sensitivity to hazardous substances at the worksite. For risk reduction screening at the worksite, ethical considerations include degree of voluntariness, potentials for misuse of information, problems of confidentiality, and the importance of providing services to support risk reduction. Risk screening also raises the problem of defining who the patient is when the screening results indicate a strong genetic component. On the positive side, however, these screening tests have the potential to reduce the level of illness and disability in society. Clinical and educational interventions can be targeted on individuals rather than groups at high risk. (ABL)

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NEW TECHNOLOGIES IN SCREENING FOR DISEASE RISK: IMPLICATIONS FOR THE WORKSITE AND FOR HEALTH EDUCATION

Presented at the American Public Health Association
Annual Meetings
New Orleans, Louisiana

October 21, 1987

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CG 021181

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New Technologies in Screening for Disease Risk: Implications for the Worksite and for Health Education. Presented at the American Public Health Association Annual Meetings, New Orleans, Louisiana, October 21, 1987. - Kenneth R. McLeroy, Ph.D.

Introduction

As I mentioned during my Introduction to the Session, I will be talking about the implications of the new screening technologies for both the worksite and for health education. Before I begin, however, I would like to alert you to some reservations that I have about my talk. First, as with any emerging technology with social and ethical implications, it is tempting to focus on either the important benefits or the significant potentials for abuse. It is hard to know what affects one's choice between a pessimistic or optimistic focus, but one thing is certain, many of the consequences will be both unforseen and unforeseeable. That is, we will not be able to anticipate many of the consequences of a new technology and we must be prepared to address emerging issues as best we can while the consequences unfold.

This does not mean, however, that sessions like this one are unimportant. Perhaps, a little foresight will help us to avoid the worst of the consequences, and to prepare ourselves to take advantage of what new technology has to offer.

A second caveat is that technology seems to create its own demands. It is difficult, if not impossible, to decide as a society not to allow a new technology to be implemented. Thus, my discussion about some of the implications for the new screening technologies is not meant to suggest that we can or

should prevent the technologies from being used. The key issue is how not whether they will be used. This session is simply a first attempt to begin to understand the implications of new technologies if we are going to try to control them.

Implications for the Worksite

Having stated these caveats, let me spend a few minutes talking about some of the implications for the worksite.

The screening of workers for health problems has been ubiquitous in the worksite for many years. Many employers use questionnaires about health status and medical examinations to screen job applicants for job openings. Many employers have also begun to use periodic screening of workers as part of on-going health promotion/disease prevention efforts to reduce the social and economic costs associated with injury, illness, and disability in the work force. For example, employers are using health risk appraisals and physical examinations to identify current employees at risk for future health problems and have implemented programs to support appropriate risk reduction strategies, as in hypertension detection and control programs. A third way in which employers may use screening procedures is to monitor the impact of toxic exposures in the worksite on employee health, particularly in chemical and selected manufacturing plants. Since these three uses of screening--pre-employment, early identification of health problems, and employee monitoring--have somewhat different ethical and policy implications, I will

spend a few moments talking about each of them in turn.

Pre-employment Screening: As noted earlier, pre-employment screening is widespread in industry. The percentage of employees required to undergo medical examinations as a requirement for employment ranges from 19 percent of employees in plants with under 250 workers, to 83 percent of employees in plants with more than 500 workers. Not only may job applicants be required to participate in a physical examination as a condition of employment, but most employers in the U.S. require that an employee provide medical information which is subsequently kept on file by the company.

While most companies use pre-employment screening for identifying job applicants with physical or mental disabilities which might interfere with job performance, companies are increasingly requesting information on behavioral or environmental risk factors which might place employees at risk for subsequent disease, injury, or disability. General Foods, for example, requires that job applicants provide detailed information about prescription and nonprescription drug use, exercise and sports participation, sleeping habits, alcohol consumption, smoking behavior, dietary practices, familial diseases, and prior workplace exposures, as a condition for employment. While it is difficult to obtain data on how risk-related information is used in actual employment decisions, it appears as if employers are increasingly moving into the risk assessment arena as a criteria for employment, rather than simply

screening for existing health problems.

So how will the new screening technologies affect the pre-employment screening process?

It has been estimated that there are 100-200 diseases for which there may be biological markers or risk factors. These include many of the major health problems today, such as atherosclerosis, hypertension, diabetes, cirrhosis of the liver, and emphysema. However, unlike older concepts of genetic screening, many of these biological markers, like lifestyle indicators, simply point to a susceptibility for disease and do not indicate with certainty whether or not the individual will develop disease. Another way of thinking about this is that many of these biological markers simply point to a risk of disease given appropriate environmental exposure, even if in many cases the environmental factors that interact with biological characteristics to produce disease are not currently known. Since the biomarkers for these diseases are simply indicators of subsequent risk, some of the new screening techniques may be thought of as a logical extensions to the risk factor screening currently being used by many of the Fortune 500 companies.

To further complicate matters, some of the environmental exposures which may interact with biological susceptibility to produce disease may be hazards produced at the worksite, and some of the biological markers linked to susceptibility for specific diseases may be protective ones. That is, it may be possible to identify individuals who are less susceptible than the average

individual to toxic hazards produced in the worksite.

So what are the ethical and policy implications for biological risk factor screening as part of pre-employment decisions by companies?

One would expect companies working with hazardous materials in the worksite to attempt to selectively screen out individuals who would be at increased risk for health problems if they were exposed to the specific hazardous materials being used. In fact, this is already occurring. Companies producing asbestos may refuse to hire smokers because of the increased risk of asbestos among smokers in the worksite. Should biological as opposed to behavioral indicators of risk be treated any differently?

One could argue that companies which selectively hire workers based on biological and behavioral risk factors are serving an important public health function by reducing the risk of disease and disability among workers. Critics of this approach, however, have pointed out that companies may use pre-employment screening as a method of decreasing the burden of illness in the work force, rather than cleaning up the worksite.

Screening for disease risk may also discriminate against individuals with selected ethnic and racial backgrounds. Many biological markers may be concentrated in specific ethnic groups, as are some genetic diseases, such as Tay Sachs and Sickle Cell Anemia. The use of these markers as a criteria for employment may result in closing certain occupations to these ethnic or

racial groups, or in the case of protective markers may result in ethnic or racial groups being concentrated in specific jobs. Furthermore, biological markers would be expected to concentrate in families, resulting in selected occupations being off limits to individuals from a specific lineage.

Least this seem far fetched, it should be noted that some jobs are already off limits to selected social groups. Women of child bearing age who have not been sterilized are already being excluded from some jobs in selected industries. One steel company has been reported to hire only deaf individuals to work in areas where there are excessive noise levels, while another employer has been reported to hire only men over the age of 50 to work where there is exposure to a potent carcinogen with a long latency period.

It may well be that we will be facing an important dilemma between strategies to improve or maintain the health of employees and access to jobs and socioeconomic position. This may be especially pronounced when we use biological markers for disease susceptibility which have nothing to do with worksite exposures. Companies have become increasingly concerned about employee health care costs with concomitant temptations to screen out of the work force job applicants who are at increased risk for major health problems and subsequent health care expenditures. Assuming a choice among applicants, a company would be remiss if it did not select the applicant with the lower health risk, everything else being equal. This has the potential for

completely excluding certain categories of workers from the larger corporations that can afford biotechnology screening services.

This suggests that biological screening may have differential effects depending upon the costs of the tests. Companies which can afford screening services may choose to limit screening to certain job classifications when the costs of screening is high. Additionally, biological screening for disease risk may be limited to the larger corporations which can afford the costs of the tests. If biological screening is used for employee selection, then, job applicants with adverse screening test results may be limited to lower paying jobs, or jobs in smaller organizations.

There are few restrictions on the uses of pre-employment screening information provided by an employee to an employer. While some companies have provided applicants with information about their use of screening information, most companies do not. Many companies simply have employees sign waivers allowing the company to use information as the company sees fit. This raises the potential for companies to share information on the results of health screens, just as some companies are said to share information on employees who have filed worker compensation claims or who have sued their employer.

Unlike credit applications to which consumers have legal access if they are denied financial services, job applicants have few rights--except those granted through collective bargaining

agreements--to medical or screening information. Equally important, except for issues about the validity of a test, it is difficult to imagine how a job applicant or employee could contest the results of biological screening.

Part of what is at issue in the pre-employment screening of workers is the validity of the tests that are used. Since many of the tests are screening for susceptibility, it can be anticipated that many of the tests will have a substantial number of false positives, particularly when the prevalence of the characteristic in the population is low. This may lead to adverse selection of a substantial number of workers who will not develop disease. As long as there is an excess of workers available for employment this may be of little concern, and yet have catastrophic effects on the excluded individuals. This may appear particularly unfair, since the individual may have no choice about their biomarkers, while they may be seen as having choices about behavioral health risks.

This discussion would indicate that biological screening tests should not be used as part of employee selection, unless the screening test indicates sensitivity to hazardous substances in the worksite. Even then, from a public policy perspective, we need to assure that the screening of workers is not being used as an alternative to controlling worksite hazards. However, given the difficulties in accessing information about employers' hiring decisions, it is difficult to foresee how the use of such information may be controlled.

It may be argued that existing regulations and legislation are sufficient to control the misuse of biotechnology screening information by employers. Equal Employment Opportunity, regulations prohibiting discrimination against the handicapped, and OSHA standards may all ultimately affect the uses by employers of screening information. However, it is not clear as to whether or not laws governing nondiscrimination against the handicapped apply to workers at risk for subsequent health problems, and to what extent the courts will allow discrimination against various social groups in employment opportunities given that there is clear evidence that the individual worker is at risk for subsequent health problems.

When I started this talk, I identified 3 uses of screening information which I said that I would touch on: (1) the screening of workers for employment; (2) the screening of current workers as part of health risk reduction strategies in the worksite; and (3) the biological monitoring of workers to measure the effects of toxic exposures in the workplace. So let me spend just a few moments on the second topic, the use of biotechnology screening for purposes of risk reduction.

Risk Reduction Screening

There are a number of important ethical issues which have been raised about screening for disease risk among employees in the worksite. These include issues about the degree of voluntariness in participation by employees; the potentials for misuse of screening information for purposes of promotion and

retention of workers; potential problems in maintaining the confidentiality of medical information and the degree of employee access to medical information; and the importance of providing employees with appropriate services to support risk reduction efforts, rather than simply providing employees with information on their health risks. While these are important topics that must be addressed in worksite screening programs, I would like to spend the limited time I have to address two other issues. One, the potential for individuals to transform the meaning of risk-related information into a belief that they have a disease. Second, issues concerning who the patient is when risk related screening results indicate a strong genetic component.

Meaning of Risk-Related Information

As everyone is aware, one of the purposes of health-risk appraisals is to provide individuals with explicit information on how their behavior is affecting their risk of death and disability, and to personalize risk information. That is, however inappropriately, health risk appraisals use population data to translate aggregate risks into individuals risks. If we begin to complement or supplement health risk appraisals with biological test for disease susceptibility, we run the risk of transforming the concept of being at risk into a concept of having a biological condition. Thus, the concept of risk may be changed into a concept of disease. Since we can anticipate that screening information will be combined with individual and group counseling sessions to explain test results, we may see health

educators beginning to serve a clinical role of providing individualized services to 'at risk' patients. The problem for the profession, then, is that we will begin to emulate a medical model in which individuals who are at risk seek the services of competent professionals for assistance in treating their 'at risk' condition. The consequences for the profession may be a shift away from population based strategies of education and prevention to a more clinical approach, further serving to increase dependence on health professionals by the population at large.

A related issue is what we do with protective factors identified during screening programs. As noted earlier, the new screening technologies may offer not only the opportunity to further individualize the at risk concept, but to identify individuals with biological factors that may serve to protect them from specific disease risks. Will this force us to move away from population approaches to reducing disease risk, such as the idea of a smoke free society by the year 2000? Will our messages about obesity and fat consumption be targeted only at individuals who are at increased risk from these behaviors?

Definition of the Patient

A second issue in the screening of workers that I want to touch on in this talk is the problem of defining the patient. As noted earlier, many of the biological markers that may be identified through screening programs include a strong genetic component. Thus, if the individual worker is at increased risk

due to the presence of some biological marker, then other blood relatives may also be at increased risk for the health problem. In such cases, who is the patient? The individual being screened? The family members? Other blood relatives? At issue is how we protect the confidentiality of screening information, while at the same time acting in a responsible manner towards other individuals who may be at increased risk.

Now, since I am running short on time, I am going to skip my discussion on the routine monitoring of patients and spend my remaining few minutes discussing the implications of the new screening technologies for the profession of health education.

Implications for Health Education

As I noted when I started this talk, it is tempting to focus on either the negative or the positive potential consequences of a new technology. In my discussion thus far, I have focused on the negative aspects because of the potentials for abuse. However, it is clear that the new screening technologies may offer an important new tool in our attempts to reduce the level of illness and disability in society. The new technology may allow us to more appropriately identify those at risk for subsequent health problems, and at an earlier stage than ever before. We can begin to target our clinical and educational interventions on individuals--rather than groups--at high risk, and to develop appropriate educational, clinical, and behavior change strategies.

In order to take advantage of the new technology, we in health education will need to begin to train students to provide counseling and supportive services to individuals identified as at increased risk for disease, including genetic counseling as part of family planning; we will need to educate the public about the meaning of the new technology; and we will need individuals trained to develop and implement socially responsible programs with proper attention to the ethical and social implications. Thus, we in health education may be partially responsible for the directions the new technology takes, by providing or failing to provide the necessary training to those working with the new screening technology.

As suggested in the preceeding talks by both Sharon Dorfman and Ruth Faden, training needs will include not only a familiarity with the technology, but the development of counseling skills and proper exposure to the enormous ethical issues raised by the technology. For once, ethical concerns must have a prominent place in the development of training programs to meet the needs introduced by the new screeing tests.